

REMARKS

A. Status of the Claims / Amendments to the Claims

In the Office Action of February 4, 2010, the status of the claims was as follows:

(1) Claims 71-76 and 81-85 were treated as “withdrawn” based on unity of invention issues.

(2) Claims 77-80 and 86-90 were rejected under 35 U.S.C. §112, second paragraph, as being “indefinite.”

(3) Claims 77-80 and 86-90 were rejected under U.S.C. §103(a) as being “obvious” based on various combinations of prior art.

In this Amendment and Response, Claims 71-76 and 81-85 have been designated as withdrawn. Claims 77, 78, 86 and 87 have been amended to address the Sec. 112 issues.

No new matter has been added. The claim amendments, which narrow the definitions of the “R” substituent groups, are fully supported by the original disclosure.

In addition, the Specification has been amended in accordance with the Examiner’s helpful suggestions.

In view of the claim amendments and the following Remarks/arguments for patentability, Applicants respectfully submit that Claims 77-80 and 86-90 are patentable over the prior art of record.

B. Amendments to the Specification

The Specification has been amended herein to correct the chemical formulas at pages 19 and 20 of the Specification in accordance with the Examiner’s suggestions in paragraph 4 of the Office Action.

C. Section 112 Issues

In paragraph 5 of the Office Action, Claims 77-80 and 86-90 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite with respect to the scope of the substituent groups R_1 to R_4 . Independent Claims 77 and 86 have been amended to narrow and clarify the scope of the groups R_1 to R_4 . Claim 78 has been amended such that the scope of groups R_1 to R_4 is within that of Claim 77 as amended. Similarly, Claim 87 has been amended such that the scope of groups R_1 to R_4 is within that of Claim 86 as amended. Applicants respectfully submit that these claim amendments obviate the §112 rejection.

D. Claims 77-80 and 86-90 Distinguish Over Tsuboyama '802 and the Other Cited References

In paragraph 7 of the Office Action, Claims 77, 78 and 86-90 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tsuboyama '802 in view of Lamansky '441, Tsuboyama '536 and the Yamazaki literature reference. Applicants respectfully request that this ground of rejection be reconsidered and withdrawn.

Claims 77-80 (device claims) and 86-90 (compound claims) are directed to particular types of diiridium compounds within the scope of this invention which differ from and are outside the scope of any of the electroluminescent compounds either actually disclosed by the Tsuboyama '802 reference or that might arguably be hypothetically encompassed by the generic chemical formulas in Tsuboyama '802. The Examiner candidly acknowledged (at page 6 of the Office Action) that the "prior art compounds [taught by Tsuboyama '802] do not meet the definition of R_1 to R_4 as defined in the present claims because each of these (Tsuboyama '802) compounds has a methyl group at the positions corresponding to present

R₁ to R₄,” (emphasis added). The claims (both before and after this Amendment and Response) define R₁ to R₄ so as to clearly exclude methyl substituent groups.

To make up for the acknowledged deficiencies in the teachings of Tsuboyama ‘802 relative to the pending claims, the Examiner has further cited the Lamansky ‘441 and Tsuboyama ‘536 U.S. patent publications and the Yamazaki literature reference. However, none of these secondary references shows any compounds that come within the scope of compound Claims 86-90. Furthermore, none of the secondary references teaches or suggests using any compound within the scope of the diiridium compounds as defined by device Claims 77-80 as an electroluminescent layer in an electroluminescent device. The Examiner has made no argument to the contrary.

Instead, what the Examiner has argued is that Tsuboyama ‘802 teaches metal coordination compounds that are “similar to compounds having the general chemical formula set forth in present claims 77 and 86.” The Examiner acknowledged that “Tsuboyama ‘802 does not disclose complexes in which two diketone ligands other than acac form the quadridentate ligand,” (emphasis added) but argued nevertheless that “other diketone ligands that could be used in place of acac were known in the art” (citing Lamansky ‘441, Tsuboyama ‘536 and the Yamazaki literature reference in support of this argument).

Reconsideration of this argument is respectfully requested in view of the amendments to Claims 77 and 86 and further in view of the following Remarks.

First, Claims 77 and 86 as herein amended define R₁ to R₄ as being selected from the group consisting of “substituted aliphatic groups and substituted and unsubstituted aromatic, heterocyclic and polycyclic ring structures.” Accordingly, the Examiner’s reference to “t-butyl groups” is no longer relevant to these amended claims.

Second, the Examiner is respectfully requested to reconsider the relevance in this application of secondary references that admittedly do not teach the claimed compounds but rather only teach compounds that are supposed to be “similar to” the claimed compounds. Chemical structural similarity may be a persuasive argument with regard to relatively simple chemical structures – of course one would expect KCl to have chemical properties similar to NaCl – but that argument rapidly loses validity as the chemical structures involved become increasingly complex. The diiridium compounds that are claimed in compound Claim 86 and device Claim 77 are very large, complex and sophisticated chemical structures. Nothing in the cited literature suggests that the claimed chemical structures even stably exist, much less how to prepare such compounds or what properties they might exhibit. In particular, nothing in the cited literature suggests that the large, awkward molecular structures of the claimed compounds would have the structural stability to survive a high-temperature vacuum-evaporation synthesis/device fabrication step.

Third, the Examiner argued that “[o]ne of ordinary skill in the art at the time of the invention, having knowledge of the teachings of Tsuboyama ‘802, would have been motivated to make similar compounds with the expectation that compounds that are similar in structure would [exhibit similar chemical properties....]” But, the Examiner has failed to explain what, other than impermissible “hindsight,” would provide the alleged “motivation” to prepare such compounds.

Nothing in Tsuboyama ‘802 suggests any problems with or limitations of the enormous array of compounds already taught by this reference; thus, there is nothing in Tsuboyama ‘802 that would “motivate” one of ordinary skill in the art to embark on a “fishing expedition” for still additional useful compounds. Furthermore, nothing in

Tsuboyama '802 would point an “explorer” seeking to expand on the list of compounds identified in Tsuboyama '802 to explore in the very specific direction argued by the Examiner – that is, apart from the teachings of this application – i.e., based on “hindsight.” Rather, the breadth of the disclosure of Tsuboyama '802 might just as well point the skilled artisan in dozens of completely different directions.

MPEP Sec. 2144.09 (I) provides that a *prima facie* case of obviousness in these situations depends on “very close structural similarities and similar utilities,” (emphasis added). Examples of such “very close structural similarities” are “position isomers ... or homologs” (MPEP Sec. 2144.09(II)) because these compounds “are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties.” Indeed, this MPEP provision cautions that, even when dealing with homologs, “[h]omology should not be automatically equated with *prima facie* obviousness....” This MPEP provision further provides the example of the case of *In re Langer*, where claims to a polymerisation process using a sterically hindered amine were found to be unobvious because “the reference as a whole did not apprise the ordinary artisan of the [inventive] significance of hindered amines as a class.”

MPEP Sec. 2144.09 (IV) addresses the relevance of whether the prior art does or does not teach a method of making a claimed compound that has been rejected as “obvious” over a supposedly “structurally similar” prior art compound. Quoting from the case of *In re Hoeksema*, this MPEP section provides that: “[I]f the prior art of record fails to disclose or render obvious a method for making a claimed compound, at the time the invention was made, it may not be legally concluded that the compound itself is in the possession of the public,” (emphasis added). In this case, none of the prior art of record teaches the method of

making the compounds of Claim 86 or as used in the devices of Claim 77, particularly not the vacuum-evaporation synthesis/device fabrication step.

The Examiner has acknowledged that neither Tsuboyama '802, nor any of the secondary references, teach vacuum evaporation of the claimed compounds. Furthermore, none of these references teach vacuum evaporation of what the Examiner has argued are the supposedly "similar" compounds. "Although Tsuboyama does not provide a device example in which one of compound Nos. 211-217, 222, 223 and 269 is vacuum deposited...." (page 8, lines 17-18 of the Office Action, emphasis added). Instead, the Examiner's argument in this regard is premised on a teaching in Tsuboyama '802 that vacuum evaporation is possible with regard to completely chemically and structurally different types of compounds!

But, there is absolutely no basis in Tsuboyama '802 or in the secondary references for extrapolating this limited teaching to other compounds (such as those of Claims 77 and 86) or for the Examiner's statement that "it is reasonable to expect that any of these [Tsuboyama '802] compounds is capable of being vacuum deposited." Such an unsupported conclusion is not reasonable at all. This statement is also squarely contrary to the standards of MPEP Sec. 2144.09 because the compounds that Tsuboyama '802 teaches can be vacuum evaporated have no structural similarities whatsoever to the claimed compounds. The Examiner's statement at the bottom of page 8 of the Office Action reinforces Applicants' belief that this entire rejection is premised on improper "hindsight" – i.e., using the teachings of this application to inform and guide the Examiner's after-the-fact interpretation of the prior art. The Examiner is urged to remember that this application – including Example 3 (as referenced by the Examiner) – was not available to those of ordinary skill in this art "at the time the invention was made."

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Amendment and Response

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In paragraph 8 of the Office Action, Claims 79 and 80 were also rejected under 35 U.S.C. §103(a) based on the combination of Tsuboyama '802, Lamansky '441, Tsuboyama '536 and Yamazaki, as discussed above, and additionally in view of Kathirgamanathan '037. Kathirgamanathan '037 was apparently cited here solely to show the use of europium complexes in an electroluminescent layer. But, Kathirgamanathan '037 does not teach or suggest the particular diiridium compounds claimed in this application either by themselves or in combination with europium complexes. Accordingly, for the same reasons argued above, this ground of rejection should also be reconsidered and withdrawn.

SUMMARY AND CONCLUSIONS

For all of the foregoing reasons, Claims 77-80 and 86-90 now pending in this application are believed to be in condition for allowance and an early notice thereof is earnestly requested.

Respectfully submitted,

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